

IMMUNIZATION STRATEGY

UNITED STATES AGENCY FOR
INTERNATIONAL DEVELOPMENT

JANUARY 1986

IMMUNIZATION STRATEGY

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IMMUNIZATION STRATEGY

I. EXECUTIVE SUMMARY

Some 3.5 million child deaths in developing countries could be averted if immunizations were widely available. More than half are due to measles alone. Immunization is highly cost-effective and should be a priority A.I.D. emphasis along with oral rehydration therapy (ORT).

A.I.D.'s objective will be to collaborate in an international effort to develop a sustained capacity to immunize the world's children. To achieve our objective we will need to work with donors and countries to define country specific coverage targets and assistance required to achieve a sustained delivery capacity dependent on human, financial and physical inputs including private as well as public sector. This will support the long-term goal of universal immunization.

The 80 percent congressionally mandated immunization coverage target is reasonable in many countries and is compatible with targets set by countries, WHO and UNICEF. Achievement, however, requires more than external funding. Political commitment, national resource allocation, health infrastructure and country absorptive capacity are equally critical. It is probably not possible to immunize 80 percent of children against all vaccine-preventable diseases in all AID-assisted countries by the end of 1990.

We should focus on immunizing children under one year of age. Children and fertile-aged women should be reached with immunizations against the six diseases, with special emphasis on measles vaccine for infants and tetanus toxoid for women. Coverage rates for these vaccines have lagged way behind, despite their relative potential impact on mortality.

Countries should be chosen for support in a manner that will maximize the health benefits that can be obtained with available resources. Criteria for setting country priorities will include infant mortality rates, current immunization rates, demographic size, host country commitment and institutional development potential and other donor involvement.

Country-specific plans need to be developed, in coordination with other donors, with campaign approaches, if appropriate, combined with the development of basic infrastructure for sustained capacity as conditions dictate.

We need to be prepared for long-term assistance in the least developed countries to develop institutional capacity and to help generate other public and private donor inputs (e.g. Rotary), donor collaboration, and local (LDC) resources.

Immunization efforts should not diminish the increased efforts in other priority child survival technologies, such as oral rehydration therapy.

A.I.D. should concentrate on areas of comparative advantage in technical leadership and assistance. These include surveillance and evaluation, planning, financial analysis, communications and marketing, training and research. We should also exploit opportunities for policy dialogue and private sector participation. Most commodity needs (vaccines, cold chain equipment, needles, syringes) are currently being provided by UNICEF, other donors and country resources. A.I.D. commodity assistance should focus on filling identified gaps on a case-by-case basis.

II. BACKGROUND

A.I.D.'s health sector strategy (May 1983) identifies the reduction of mortality in infants and children as its primary objective. The strategy emphasizes immunizations and oral rehydration therapy, along with family planning and nutrition monitoring. The Child Survival Action Program and the recent Foreign Assistance Authorization legislation seek as well to maximize the total numbers of children's lives which can be saved through the use of simple, cost-effective means such as immunizations.

At least 3.5 million children die each year from immunizable diseases and their complications. As many more are at risk of death from other causes due to malnutrition induced by these diseases. These deaths are preventable. More than half are due to measles alone.

In Asia, for example, where measles is the most significant vaccine-preventable cause of death, less than 10 percent of infants under 1 are immunized. Tetanus immunization of pregnant women is uniformly low (only 9 percent in Africa and negligible in Bangladesh and Pakistan), while neonatal tetanus constitutes a major cause of infant mortality.

The coverage rates of infants for polio and diphtheria-pertussis-tetanus (DTP) are higher, averaging 36 percent, but very significant preventable morbidity and mortality persist due to

pertussis, diphtheria and tetanus. Polio, while resulting in morbidity and non-productivity, is not a major cause of death but has significant economic and social consequences. BCG (vaccine for tuberculosis) coverage is highest among the vaccines (40 percent), in part because of the ease of administration--a single dose, often given at birth.

The age of the children when vaccines are administered, the number of doses of vaccine, and the cold chain requirements have influenced the coverage that has been achieved. For example, vaccines for diphtheria, tetanus and pertussis (DTP) and polio are given in the first months of life and require 3 doses; measles vaccine must be given at 9 months. These vaccines require storage at 0-8° centigrade. Recent developments in cold chain technology make this feasible in most cases. Implementation of cold chain will require significant improvements in supervision, training and logistics support.

The universal immunization of infants is an appropriate long-term goal. The 80 percent coverage target set in the Foreign Assistance Authorization Act to be achieved by the end of 1990, as with the WHO/UNICEF goal, can help generate political commitment and mobilization of resources towards expansion of an exceedingly cost-effective technology which can save millions of lives. Furthermore, establishing a basic infrastructure through expanded immunization programs contributes to the delivery of other key health interventions as well, including oral rehydration, growth monitoring and family planning. International experts recognize that the financial resources, the necessary institutional development and the political commitment, all of which vary significantly among countries, will not be adequate to immunize 80 percent of all children against all vaccine-preventable diseases in all A.I.D.-assisted countries by 1990. Nonetheless, only through the enunciation of time limited targets will all the obstacles to eventually achieving universal immunization and the true dimensions of the task be fully known.

Coverage will be most difficult to achieve in those countries which lack basic infrastructure, trained manpower and a motivated populace. Thus, in Latin America and the Caribbean, where basic infrastructure is more developed and present coverage rates are higher than in other regions, 80 percent coverage rates are probably achievable by 1990. In most African and South Asian countries, where the vaccine-preventable diseases take their greatest toll, progress will be slower. Nevertheless, through emphasis on programs in those countries with lower coverage rates, significant overall mortality declines can be achieved over the next 5 years.

III. STRATEGY OBJECTIVE

Equally as important as reaching target coverage goals is the institutional capability to continue delivery of immunization services for each successive cohort of children. Thus, the A.I.D. objective should be:

To collaborate in an international effort to develop a sustained capacity to provide immunizations for all the world's children, including development of the role of the private sector.

Within that framework, specific coverage goals should be defined for each assisted country, depending on the level of political commitment and human, financial and physical infrastructure, while being mindful of the 80 percent coverage target established for 1990 and the ultimate target of universal immunization.

There are six principal elements to this strategy:

- 1) The primary target group of children should be infants ages 0 through 11 months of age (in remote rural areas, children up to 2 years are still at high risk of diseases like measles). These are the children most vulnerable to preventable disease and death. Measles begins as soon as maternal antibodies disappear in areas of high endemicity, which has led to the WHO recommendation that the age of measles immunization be 9 months, the earliest time when almost all babies will have an immune response, rather than the 12-15 month age previously targeted in developed countries. If delayed past 9 months to 1 year, a rapidly increasing and significant percentage of children will have had natural measles and many will have already died. Pertussis is most dangerous in infants where the narrowness and flexibility of respiratory passageways make this disease potentially fatal. Thus, special efforts to vaccinate surviving older children, many of whom have likely already been infected, would produce only small improvements in health for the large investment required. While no special programs will be set up to catch up with unvaccinated older children (up to 5 years of age), those at risk should also be offered vaccination as long as resources are available. After the program has been operating effectively for several years the need for catch up efforts will diminish.

The primary target group for tetanus toxoid vaccination should be the fertile-aged women, particularly the younger ones so that as many pregnancies are covered as possible.

- 2) Certain vaccines and diseases must be emphasized in targeting efforts to gain maximum impact on childhood mortality. While the six selected vaccines should be included in delivery programs certain vaccines should have priority. Measles (infants) and tetanus (mothers) lag far behind the other vaccines in coverage. Measles is the major cause of death preventable by immunization, but has the lowest current coverage. Tetanus immunization of child-bearing aged women would protect infants and their mothers. Immunization against polio may also be an important initial priority because of its political, social and economic importance, as well as the potential for its eradication in the Western Hemisphere. In all instances final decisions on vaccine priorities will be based on country specific criteria.
- 3) A.I.D. should plan for targets and inputs, coordinated with other efforts, at the regional and country level. While general disease patterns are shared by many developing countries, specific diseases and the factors producing them may vary substantially in priority from country to country, thus producing variability in the feasibility of related control measures. So too will the capacity and level of functioning of the health services in general, and the immunization services in particular, vary among countries. Immunization assistance plans should be developed at the country level as a first step in this effort including acquisition and analysis of baseline coverage, epidemiologic and financial data, and definition of vaccine specific targets.
- 4) Countries should be chosen so as to maximize the health benefits that can be obtained with available resources. The health benefits are ultimately measured by the number of vaccine preventable deaths associated with a given investment. While the required epidemiologic and program data are generally lacking for quantifying this assessment, the following factors will argue for a higher priority.

- High infant mortality. Generally this will be associated with a high incidence of vaccine preventable diseases and high case fatality.

- A demonstrated need for vaccinations indicated by low current coverage rates.

- The greatest potential impact on children's lives. In many cases this will argue for large countries, where the resources for project administration and technical assistance are spread over large populations.

- Host country commitment and institutional development potential.

- Donor cooperation. This will involve assessment of other donor support, identification of appropriate AID interventions, and the possibility of collaborative activities to maximize effective use of resources.

- Budgetary considerations. Availability of ESF or PL480 generated local currency will enhance the potential for programming immunization activities in eligible countries.

- 5) A.I.D. should emphasize institutional capacity in its goal to develop sustained immunization service delivery. In order to build the capacity to reach the target population, the immunization program needs to make services geographically and temporarily, as well as economically, accessible. Our country-specific plans should aim towards strengthening and expanding existing infrastructure, promoting community participation, and exploring both public and private sector delivery mechanisms.

Nonetheless, a certain level of capacity within the immunization system is necessary as a foundation for these efforts to be successful, and more importantly, to sustain the capability to deliver services. Plans need to include the development of repeated services for immunization based on country-specific needs, whether or not coupled with campaign approaches.

Campaign-type efforts such as those in Colombia and Ecuador have succeeded in producing community

participation not equaled by more conventional approaches and may be an appropriate element of a country immunization strategy. Also, the mobilization of manpower from outside the health care sector to participate in immunization, which occurs on such days, may be essential to achieving the high rates of coverage which are being attained.

A.I.D. should support campaign-type efforts in countries where such mobilization of political commitment and resources can achieve high coverage levels, only if the government, local private sector and/or other donors are making complementary investments in developing the basic human, financial and physical infrastructure to sustain the immunization effort.

6. A.I.D. should continue its efforts to expand other key child survival services, such as ORT, along with the efforts in immunization to help build a self-sufficient system that can deal with critical health needs over the long term. To avert a death from neonatal tetanus, only to have the child die instead from dehydration and malnutrition will not advance infant mortality reduction goals.

IV. A.I.D. AND OTHER DONOR INVOLVEMENT

Strong congressional interest is demonstrated in the U.S. Foreign Assistance Authorization bill which includes a target of 80 percent immunization coverage in A.I.D.-assisted countries by the end of 1990. The momentum for international support of expanded immunization is demonstrated by the U.N. General Assembly reaffirmation of the declaration of universal immunization for children, the goal of polio eradication in the western Hemisphere, and the Bellagio group meeting in mid-October 1985.

Given the magnitude of the task, a major multi-donor effort is required, of which A.I.D. will be one of several actors. WHO, UNICEF and the Bellagio group have already initiated major activities. Support for immunization from donors is increasing. The Government of Italy has made \$100 million available to assist in immunization programs in 29 countries, 26 of which are African. Support for efforts to eradicate polio in the Western Hemisphere is substantial, with Rotary, a private organization, making a large contribution (\$10.7 million), accompanied by the Inter-American Development Bank (\$5.5 million) and PAHO (\$4.6 million).

In 1983-84, total immunization expenditures from all sources in developing countries approximated \$300 million, 20 percent of which (\$60 million) came from the donors. To reach near universal coverage would require vast increases, from both donors and developing countries. As illustration, based on current coverage, it would cost \$340 million above current expenditures, to vaccinate 80 percent of infants in 17 of the largest A.I.D.-assisted countries in a given year. In addition, as much as \$275 million above current expenditures would be required to sustain coverage each year thereafter.

Given deteriorating economic conditions in most of these countries, particularly those with low coverage rates, new local resources are unlikely to increase significantly. A small fraction of national health budgets is allocated for preventive care such as immunization in most developing countries. A.I.D. and other donors will need to work with countries to increase the proportional health expenditures going to immunization programs, through resource reallocation, local cost recovery (particularly for curative services) and improved efficiency.

In FY 85, some \$20 million of A.I.D.'s \$250 million health budget (Development Assistance and Child Survival) supported immunization service delivery. In view of the importance of this intervention, assuming an overall health budget similar to the FY 85 level, we should aim to double our support for immunization services in FY 86 (i.e. at approximately the \$40 million level). Implications for FY 86 programming are described on p. 14. Levels for FY 87 and beyond will be determined once the country-specific plans have been developed. (See Appendix Two for status of A.I.D. immunization activities.)

V. MAJOR PROGRAM ELEMENTS AND POTENTIAL A.I.D. SUPPORT

The following discussion is focused on the primary program elements of the international immunization effort and potential A.I.D. support.

1) Client Behavior and Marketing

Immunization efforts (Expanded Program In Immunization - EPI) have traditionally focused on strengthening the delivery system, and have to a large extent ignored the behavioral factors which have played a major role in inhibiting effective coverage. This is not only true where

coverage rates are low. Ironically, we have found that in the U.S. the higher the coverage, the less people fear contagion, the less incentive they have to be immunized. To achieve substantial increases in coverage more rapidly than increases in overall educational levels among mothers, major investments should be made in identifying barriers to the acceptance of vaccination and in overcoming them through effective communication. Social marketing and similar approaches are also critical to sustaining demand. Some believe on the basis of experience (smallpox eradication and U.S. laws requiring immunization before entry to schools), that strong incentives are necessary to achieve and maintain high levels of coverage. Knowledge, attitude and practice surveys may be needed and the use of incentives needs to be explored. The U.S. has special expertise in the areas of mass media and social marketing, and should exploit its comparative advantage.

A.I.D. should also use its resources for marketing at another level, to help convince senior decision makers in developing countries of the importance of increased immunization efforts.

Recommendation: Explore with Resources for Child Health Project, HEALTHCOM and CDC the need for additional activity in the generation of demand for immunization services.

2) Manpower Development

a) In-country Personnel

The WHO Expanded Program in Immunization (EPI) has provided leadership in training in-country managers of immunization programs and we can build on their experiences.

In-country personnel who need training include epidemiologists, planners, managers, supervisors paramedicals, cold chain and vehicle maintenance staff, information specialists and supply managers. A problem among the lower levels of health personnel is the high turnover rate among personnel that leads to a low institutional memory or retention of skills and learned capacities.

A.I.D. should continue to emphasize training, but should increase the emphasis on continuing education. On-the-job training strategies which respond to problems detected through effective monitoring and provide for the constant

inclusion of new personnel meet training needs in a way which widely-separated one-shot training approaches cannot.

b) Technical Assistance

A serious shortage of experienced technical assistance for immunization programs currently exists. The smallpox eradication effort provided an illustration of the extent to which expatriate manpower and managerial involvement was necessary to achieve a highly demanding goal. In many developing countries where current capacities are extremely limited, increased numbers of outside manpower will be required to achieve what is a similarly demanding goal. The presence of such manpower over longer periods of time, at peripheral as well as central sites, will both allow immunization coverage goals to be reached and provide the opportunity for on-the-job training of the large number of skilled personnel needed to sustain the system over the long run. Expert advice to PVO's already delivering immunizations and other health services may also allow current resources to be more cost-effectively used.

In collaboration with other donors we need to identify and expand the pool of U.S. and other experts as well as consider the potential role of Peace Corps and other volunteers at the peripheral levels.

Recommendation: Assess training needs and available materials, courses, institutions and technical experts through WHO, CDC and Resources for Child Health Project. Support provision of appropriate technical assistance and training.

3) Vaccine and Commodity Supply

a) Vaccine Production

Vaccine production covers a continuum of activities, from activity testing of prepackaged vaccines after importation, at the simplest level, to actual production and testing of viral vaccines, at the most complex. Skilled and experienced manpower and facilities are needed at all levels. A.I.D. can make a valuable contribution by working with other donors in the assessment of current production capacity, the preparation of a long-term plan (15 to 20 years), and the necessary assistance to achieve an appropriate level of self-sufficiency on this continuum through training, capital development, and the strengthening of the logistics/supply system.

b) Revolving Fund for Vaccine Supply

PAHO has made a major contribution to immunization programs in the Americas through the establishment of a Revolving Fund for the purchase of vaccines by PAHO member nations. This Fund, initially capitalized by PAHO, donor organizations and the countries themselves, has accomplished several things that the countries were not able to do on their own. The Fund achieves significant cost savings by purchasing vaccines in large quantities. The Fund is also able to convert currencies, purchasing vaccines with hard currencies when necessary, but receiving payment from each participating country in its own currency. In addition to these obvious advantages there are other less visible benefits from the Fund. PAHO can monitor vaccine quality more effectively than can individual countries. The development of a fairly rigid estimating--ordering--receipt--payment--use cycle has imposed a structure on country EPI planning that has resulted in better planned programs. The Fund, which makes payments directly to suppliers, makes timely payments thus taking advantage of the most favorable terms. The Fund, in turn, can offer more flexible terms to participating countries.

Assured supplies of vaccines at reasonable prices has resulted in improved immunization rates in the PAHO region. A.I.D., jointly with WHO and UNICEF should investigate the possibility of developing similar vaccine supply services in other regions of the world.

c) External Commodity Support

At present UNICEF provides the majority of commodity requirements in many countries including vaccine and cold chain equipment. A.I.D. should continue to encourage UNICEF expenditures in this area, as well as directly providing limited start-up commodity support to target countries where indicated to promote policy objectives or meet critical need. A.I.D. will strongly encourage developing countries to follow WHO guidelines on the appropriate sterilization of needles and syringes in immunization programs given concern about potential transmission of infections. Prevention of infection transmission will be addressed in the design, implementation and evaluation of A.I.D.-assisted projects. Cautious consideration should be given to the provision of commodities, recognizing the need to avoid establishing a practice which would result in foreign currency expenditures unmanageable by the recipient country.

Recommendation: Rely primarily on UNICEF for commodity provision but explore potential appropriate technology development in country, particularly when private enterprise related, and explore the feasibility of a Revolving Fund for the purchase of vaccines in regions other than LAC.

4) Surveillance

Countries with the assistance of WHO are developing information systems to monitor immunization coverage and disease impact. U.S. assistance to strengthen this important component is needed.

To remain abreast of the disease and immunization situation, and of the activities and needs of the country immunization programs throughout the developing world, a surveillance and information center/function is needed. From country representatives involved directly in immunization planning and monitoring, information would be collected and analyzed to allow for relevant planning by the countries and donor groups. Sentinel surveillance has been identified as one approach to obtain data on disease trends for a minimal expenditure of resources. One or more institutions are selected which represent disease activities in the community. Collecting full and complete data from these few institutions enables program managers to determine if immunizations are reducing morbidity and mortality. While such surveillance does not identify all cases, it monitors trends. Such approaches need to be explored, and A.I.D. needs to be ready to assist countries with developing their own appropriate information systems.

Recommendation: Explore with WHO and CDC possible development and support for such a function/center. Assist countries with development of information systems.

5) Capital, Recurrent and Local Cost Support

The capacity of many countries is at the present so limited that it is simply impossible to imagine their assuming all or even the majority of the local costs which will be necessary to reach the high coverage target in the foreseeable future.

In addition, it may be unrealistic to expect families to pay for a significant portion of the actual costs of preventive care such as immunizations when even free immunizations cannot attract an adequate percentage of the public. With this in mind, A.I.D. and other donors should face squarely the necessity to support some local and recurrent costs for some time in many countries.

However, there are ways to maximize the cost-effective use of what local resources are available. More resources within the health sector may be channeled into immunization and other preventive and promotive services than is now the case. Fees or insurance schemes, particularly for curative services, can be developed. Cost containment measures can be instituted. Through policy dialogue and technical assistance, we need to help explore the options for resource reallocation, cost recovery and improved efficiency of health systems. Issues particularly appropriate for policy dialogue include tariff and import duties on vaccines, licensure, role of the private sector, and marketing and communication concepts. Furthermore, operations research and vaccine related research sponsored by A.I.D. may potentially have dramatic effects on costs. Improved dosing schedules requiring fewer immunization visits (through more potent and stable vaccines) could free up valuable resources for outreach and other immunization activities.

To supplement A.I.D.'s traditional support, additional funds can be generated through U.S. private organizations (following the Rotary Model). ESF funds can be used in eligible countries. Under the PL 480 program, local currency generated as a result of sales of surplus U.S. agricultural commodities can be used for health sector activities. In a limited number of countries this has been done; ways to expand the use of local PL 480 generated funds are being explored as an additional way to meet local cost needs.

Recommendation: Undertake an analysis and the development of a strategy (through The Resources for Child Health Project) to find ways to mobilize increased resources for immunization (and other key child survival technologies) in the developing countries.

6) Research Support

While priority emphasis needs to be placed on achieving far more adequate delivery of present vaccines, useful

improvements can also be made in the current technologies. A.I.D. should continue to provide funds for malaria vaccine development, for testing means of giving measles vaccine at an earlier age, for continuing the development and testing of rotavirus vaccines, for improving the present pertussis vaccine, for reducing number of doses required and cold chain requirements, and for developing strategies for overcoming present current behavior-related barriers to immunization.

Despite extensive experience, the determinants of cost-effective immunization programs remain poorly understood. The design and implementation of any given program involves hundreds of management decisions, few of which can presently be based on empirical data. Even relatively small improvements in long-term programs of such a scale would justify major efforts in operations research and evaluation. Many elements of obvious relevance to the health impact of these programs have received surprisingly little attention from investigators. Such topics as; locale-specific epidemiologic patterns, beliefs and values associated with acceptance and demand for immunizations, routine detection and recruitment of susceptible children, campaign versus continuous service approach, management of side effects, or monitoring the integrity of the cold chain, need further research.

Recommendation: Continued targeted support for vaccine development and increased operational, epidemiologic, and behavioral related research through appropriate mechanisms including PRICOR and Johns Hopkins University, IIP.

VI. PROGRAMMATIC IMPLICATIONS FOR FY 86

1. Strong guidance to selected priority countries to develop immunization projects in collaboration with other donors.
2. Exploration of a long-term project with CDC in cooperation with WHO for surveillance, information, training and T.A.
3. Exploration of increased use of PL480 and ESF for immunization activities.
4. Exploration of local production activities, possibly involving PRE, and the need for a Revolving Fund for vaccine purchase.

5. Increased attention to communications and marketing, program planning, implementation, training and financial analysis.
6. A review of the current portfolio to emphasize EPI and ORT, with possible add-ons to selected projects; and to de-emphasize unfocused health care programs.
7. An FY 86 immunization funding target of at least \$40 million for immunization services delivery from Development Assistance Funds.

Appendices:

- I. Estimated costs of immunizing infants and fertile-aged women
- II. Status of A.I.D. activities in immunization

ESTIMATED COSTS FOR IMMUNIZATION OF INFANTS AND FERTILE-AGE WOMEN
IN THE SEVENTEEN LARGEST AID-ASSISTED COUNTRIES (IN MILLIONS \$)

| Country | INFANT IMMUNIZATION SERIES | | | | TETANUS IMMUNIZATION | | | | Total Current Immunization Coverage Costs | Cumulative Additional Cost for Total Coverage |
|---------------------------------------|--|---------------------------|--|---|--|--|--|---|--|---|
| | Total # Newborns ⁴ (Millions) | % Coverage Estimate | Cost of Current Coverage @ \$10 | Additional Cost for Total Coverage @ \$10 per Person | Total ⁵ Number Women Ages 15-49 Years (Millions) | % Tetanus Coverage of Pregnant Women | Cost ³ of Current Coverage @ \$2.50 per Person | Additional Cost For Total Coverage | | |
| Africa Total | 10.23 | | 88 | 93.5 | 57.4 | | 0.1 | 143.5 | 8.9 | 237.0 |
| Nigeria | 4.07 | ... | ... | 40.7 | 20.78 | ... | ... | 52.0 | ... | 92.7 |
| Ethiopia | 1.54 | 7 | 1.1 | 14.3 | 8.22 | ... | ... | 20.6 | 1.1 | 34.9 |
| Egypt | 1.51 | 30 ¹ | 4.6 | 10.5 | 10.85 | ... | ... | 27.1 | 4.6 | 37.6 |
| Zaire | 1.34 | 20 | 2.7 | 10.7 | 7.49 | ... | ... | 18.7 | 2.7 | 29.4 |
| Sudan | .89 | 4 | 0.4 | 8.5 | 4.85 | 1 | 0.1 | 12.0 | 0.5 | 20.5 |
| Kenya | .88 | ... | ... | 8.8 | 5.22 | ... | ... | 13.1 | ... | 21.9 |
| Asia & Near East Total | 46.06 | | 113.6 | 346.1 | 373.42 | | 154.6 | 722.4 | 268.2 | 1068.5 |
| India ² | 24.84 | 0(39) | 72.7 | 175.7 | 206.30 | 24 | 123.7 | 392.0 | 196.4 | 567.7 |
| Indonesia ² | 5.30 | 2(29) | 11.6 | 41.4 | 46.65 | 15 | 17.5 | 99.1 | 29.1 | 140.5 |
| Bangladesh | 4.21 | 2 | 0.1 | 41.2 | 21.94 | 1 | 0.5 | 54.3 | 0.6 | 95.5 |
| Pakistan | 4.11 | 6 | 2.5 | 38.6 | 22.62 | 1 | 0.6 | 56.0 | 3.1 | 94.6 |
| Philippines ² | 1.87 | ...(51) | 7.2 | 11.5 | 13.72 | ... | ... | 34.3 | 7.2 | 45.8 |
| Thailand ² | 1.78 | ...(53) | 7.8 | 10.6 | 13.28 | 30 | 10.0 | 23.2 | 17.1 | 33.8 |
| Turkey | 1.60 | 52 | 8.3 | 7.7 | 11.83 | ... | ... | 29.6 | 8.3 | 37.7 |
| Burma | 1.37 | 0(9) | 0.9 | 12.8 | 9.23 | 10 | 2.3 | 20.8 | 1.2 | 33.6 |
| Morocco ² | .98 | ...(44) | 3.2 | 6.6 | 5.23 | ... | ... | 13.1 | 1.2 | 19.7 |
| Latin American Total | 3.78 | | 4.2 | 33.6 | 23.95 | | ... | 59.9 | 4.2 | 93.5 |
| Mexico | 2.93 | 8 | 2.3 | 27.0 | 18.73 | ... | ... | 46.8 | 2.3 | 73.8 |
| Columbia | .85 | 22 | 1.9 | 6.6 | 5.22 | ... | ... | 13.1 | 1.9 | 19.7 |
| Total | 60.07 | | 126.6 | 473.2 | 454.77 | | 154.7 | 925.8 | 281.3 | 1399.0 |
| 80% Coverage ⁶ | 48.06 | | | 340.8 | 363.82 | | | 640.8 | N/A | 981.6 |
| Cover only all pregnant women | | | | N/A | | | | 131.2 | N/A | 472.8 |

- Complete immunization series coverage <1 yr "Egypt: Child Survival" Project Paper, USAID July 1985
- Country where coverage for completed DPT series is significantly higher than measles vaccine coverage. In this case, DPT coverage is listed in parentheses and a marginal cost of \$2.50 is used to determine the cost of adding measles immunization for that portion of the population already receiving services. For the remainder, the full cost estimate (\$10) is used.
- If coverage rates for women are not available, 0 percent coverage is assumed.
- Data from the Expanded Program in Immunization presented in R.H. Henderson. Vaccine Preventable Diseases of Children: The Problem in Protecting the World's Children: Vaccines and Immunization. The Rockefeller Foundation, 1984. Measles coverage used as surrogate for EPI coverage unless noted otherwise.
- United Nations World Population Prospects: Estimates and Projections as Assessed in 1982. United Nations: N.Y. 1985
- Calculated country by country to bring each up to the 80% coverage level.
... data not available
N/A Not Applicable

APPENDIX TWO

A.I.D.-Supported Immunization Activities

A.I.D. is supporting projects in 23 countries which include emphasis on immunization activities. In addition, 53 countries have health service projects with less focused immunization components.

Projects with Special Immunization Emphasis

AFRICA BUREAU

Africa Regional 698-0421 1978-1987 \$45,000,000

- Combatting Childhood Communicable Disease

Purpose: Strengthen Sub-Saharan Africa's ability to control childhood diseases. Activities in Zaire, Togo, Liberia, Congo, Central Africa Republic, Swaziland, Lesotho, Malawi, Rwanda, Guinea, Ivory Coast, Burundi, WHO/AFRO.

Chad 698-0513 1985-1990 \$1,123,000

- Contribution to UNDP to Support Training and Child Survival in Africa

Purpose: Provide vaccines, logistic support, training to expand immunization coverage. Approximately \$700,000 currently funded for immunization activities.

Djibouti 603-0014 1983 \$1,000,000

- Food and Nutrition Grant

Purpose: Provide TA in ORT and immunization. Approximately \$700,000 currently funded for immunization activities.

Mauritania 682-0230 1984-1988 \$5,000,000

- Rural Health Services

Purpose: Assist in developing primary health care systems.

Niger 683-0202 1978-19861 \$12,029,000

- Improving Rural Health

Purpose: Strengthen and expand existing health care systems.

Senegal 685-0242 1984-1989 \$9,225,000

- Rural Health Services II

Purpose: Extend primary health care in Sine Saloum Region. Approximately \$500,000 currently funded for immunization activities.

ASIA/NEAR EAST

Indonesia 497-0253 1979-1987 \$12,700,000

- Expanded Program on Immunization

Purpose: To improve national immunization program.

 263-0203 1981-1986 \$11,000,000

- Comprehensive Health Improvement Project, Provincial Specific

Purpose: \$600,000 for expansion of the neonatal tetanus program

Nepal 367-0135 1980-1987 \$35,200,000
- Integrated Rural Health & Family Planning Project
Purpose: \$400,000 for expansion of immunization nationwide focussing on measles and neonatal tetanus.

Pakistan 1982-1987 \$20,000,000
- Primary Health Care
Purpose: \$800,000 to support expansion of the national EPI program.

Egypt 1985-1990 \$72,900,000
- Child Survival
Purpose: \$25.8 million to support expansion of the national EPI program.

LATIN AMERICA

Ecuador 518-0015 1985-1988 \$3,000,000
- Child Survival Action Program
Purpose: Expansion of integrated rural health program nationwide.

Guatemala 520-0339 1985-1988 \$3,000,000
- Immunization for Child Survival
Purpose: Expansion of immunization in rural areas aimed at reaching 80% of children before their second birthday.

Haiti 938-0508 1985-1988 \$310,000
- Child Immunization Project
Purpose: Expanded program to reach 200,000 children 0-5 years and their mothers with immunization services.

Peru 527-0167 1985 \$500,000
- ORT Mass Media Program for Child Survival
Purpose: Local effort to focus on ORT, immunization messages in media.

SCIENCE AND TECHNOLOGY BUREAU

Worldwide 93659027.03 1985-1990 \$20,000,000
- Primary Health Care Technologies II
Purpose: To strengthen primary health care through the introduction of key disease control technologies, by improved management, and training.